XIII. *An unrecognised European* Lycaena, *identified as* Agriades thersites (*Boisd. MSS.*) *Cantener.* By T. A. Chapman, M.D.

[Read June 5th, 1912.]

Plates LXXXI—LXXXV.

Nearly two years ago Mr. P. P. Graves (of Constantinople) sent me some specimens of a blue butterfly taken by him in Syria on the Cedar Mountains, asking me to determine it. It was somewhat puzzling and I finally decided to declare it a new species under the name of *Agriades gravesi*, with description and figures in the Ent. Mo. Mag., p. 159 (1912).

In investigating *gravesi*, I came across some Asiatic (Tianshan and Amasia) specimens supposed to be *icarus* ab. *icarinus*, but found that they were not a *Polyommatus*, which *icarus* is, but an *Agriades*.

Whether Tutt's division of certain Plebeiid butterflies between these two genera be accepted or not, it is certain that the most typical species of each group have very decided structural differences from those of the other.

What were these Asiatic *Agriades* passing as forms of a *Polyommatus*? A new species possibly, with which I could do little or nothing, having no great supply of material and that of somewhat vague origin. It was clearly related to *gravesi*, but by no means certainly the same species. It finally, as it ought to have done sooner, occurred to me to examine European *icarinus*, and I found at once that they agreed with these Asiatic examples. There were of course genuine *icarinus*, i. e. *icarinus* that were forms of *icarus*, also. No English specimen of the new species has so far come before me and I believe there are none, all English *icarinus* are varieties of *icarus*.

I think it is probably the case that *icarinus*, the aberration of *icarus*, is as scarce on the Continent as it is in England and that the great majority of specimens that are accepted as that aberration are in reality

thersites. It so happens that I have obtained *thersites* from various continental localities, but have not received from any continental dealer a genuine European *icarinus*, although I have several Asiatic specimens.

Having obtained possession of Tutt's series of "*icarus*," or most of them, I found I had amongst them a sufficiency of the new species (*thersites*) to enable me to reach some very definite conclusions and to find several structural details differentiating it from *icarus*.

Tutt's habit of taking long series of each species from each locality he visited, and especially devoting time to this, wherever much variation occurred, has resulted in this accumulation of material and it would have gratified him to have found it so useful in this instance.

Tutt, in his account of *icarus* ab. *icarinus*, no doubt refers to our species, when he says (Brit. Butts., iv, p. 159) in some places "as common as the typical form, whilst in others again it is much more common and almost racial"; "in the lower valleys of the Dauphiny Alps—Bourg d'Oisans, Bourg d'Aru, La Grave, Clelles, etc., the form is abundant and almost racial in both sexes." "It is very abundant in some seasons at Gresy-sur-Aix (July 21, 1897, August 21, 1906); at Bourg St. Maurice (August 1–7, 1898, August 1–5, 1905)." "Commonly between Vex and Useigne on August 13, 1903." Other references may be to *thersites* or to genuine *icarus* ab. *icarinus*.

That Tutt did not appreciate the full meaning of these facts, was no doubt largely due to the circumstance that in most cases there is absolute mimicry between *thersites* and the form of *icarus* with which it occurs.

This peculiarity of the species no doubt goes a very long way to account for the refusal of Entomologists to recognise it as distinct. When it occurs with *icarus*, it, in each instance, imitates very closely the particular form of *icarus* that occurs in that locality. This is very marked in some specimens I have from the Tutt collection, of which I may mention a large form from Pré St. Didier, in which both species attain to 38 and 39 mm., a rather less large one from Trelex of 36 to 37 mm. in both species; the whole tone of colouring, intensity of orange marginal spots, and other markings, make each such association identical throughout in both species, except of course as regards one or two distinctive points. There

are, however, other localities in which the two species seem to be quite independent.

The definite distinction between *thersites* and *icarus*, which first attracted my attention, was in the male appendages. No doubt the chief reason that the species has for so long been refused recognition is that apart from the genitalia (both sexes) and the androconia, no character can be stated that absolutely and certainly distinguishes *thersites* from *icarus*, though there are some points that are very useful for that purpose.

It would appear that no one has chosen hitherto to examine either the genitalia or the androconia of the species, certainly not comparatively with those of *icarus*.

The whole of the Plebeiid blues have a very similar form of appendages in the male, and in some species there is a considerable range of variation in some particulars, so that there is, in such cases, a difficulty in seizing constant points by which to separate allied species. In the present case, however, no such difficulty arises, as the differences between the two species are such as are not only of decided specific value, but actually of generic, or at any rate of subgeneric importance, placing *icarus* in the genus *Polyommatus*, Latr., and *thersites* in *Agriades*, Hb., accepting these genera as adopted by Tutt, who distinguished between them before the differences in the genitalia were noted.

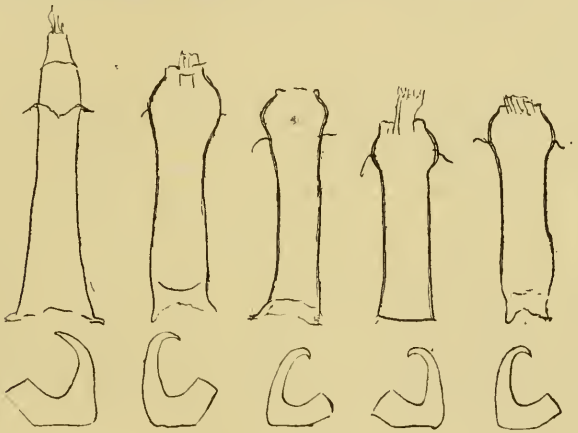
I have made camera sketches of the most important (for differential purposes) structures in *icarus*, *thersites* and in *escheri*.

The form of the Aedeagus is very different in *icarus* (*Polyommatus*) from that in *thersites* and *escheri* (*Agriades*). It will be noted that *thersites* and *escheri* are almost identical except in size, *escheri* being decidedly larger as 6 to 5. The dorsal hooks also differ notably, the portion that is upright in the sketches is broader basally and tapers more regularly in *icarus* and is fairly straight terminally. In *thersites* and *escheri* it is comparatively narrow basally, tapers more slowly, and has a hooked curve at the end, it is and looks longer and more slender than in *icarus*. As in the aedeagus, *thersites* is here distinctly smaller than *escheri*, as it is in the other portions of the appendages.

What is the relation of *thersites* to *escheri*? The genitalia appear to be the same except in a constant difference in

size, which holds so far as I have examined them throughout the range of both species independently of the actual size of the specimens, so that it is impossible to accept them as one species, though that *thersites* is a derivative of *escheri* is extremely probable (a form that somehow found its living could best be got by mimicking *icarus*?).

I now accept *gravesi* as a form of *thersites*. The genitalia appear to prove this, though it has a very different facies from the *icarus* of the district in which it occurs and is not quite identical with any *thersites* I have seen.



Camera outlines of the *Aedeagus* and dorsal hook × 30 of—

1. *Polyommatus icarus*. 2. *Agriades escheri* (*Gavarnie*).
3. *Agriades thersites* (*Pré St. Didier*). 4. *Agriades thersites* (*Trelex*).
5. *Agriades thersites* (*Altai*).

Photographs of the ♂ appendages of *thersites* (var. *gravesi*) and *escheri* will be found in the E.M.M. 1912, pl. VII and VIII.

Gravesi is therefore a local race of *thersites*.

Having got so far the question arose, did the name *icarinus* belong to this new species or to the variety of *icarus*. Scriba's original note and the figure in Esper to which he refers give us really no assistance in deciding the point, and there seems therefore every reason to leave the name *icarinus* to apply to the *variety* of *icarus*, as it has been supposed to do for a hundred years or so.

Thersites, Boisd., appeared to be a *nomen nudum*, and it seemed highly probable that it referred to *icarinus*, accordingly, I wrote and presented this paper to the

Society with *Agriades alexius*, Frr., in the title. I have, however, since (November) met with a reference to the butterfly in Cantener.* On plate XI he figures upper and underside of "Argus Alexis ♂," the text deals with "33. Argus Alexis, (1) Fab. God. Boisd., pl. XI, fig. 1 et 2," followed by twenty-one lines, referring only to *Alexis* (*icarus*), but the note (1) says, "L'individu figuré ici est le véritable Thersites, Boisd. (collection). Cet Argus a été confondu jusqu'a présent avec l'*Alexis*, et n'en diffère que par l'absence de deux points ocellés placés près de la base des ailes supérieures. On le rencontre aussi communément dans le midi de la France que l'*Alexis*."

So far as the description goes it does not rescue the insect from being confused with *icarus*, var. *icarinus*. But when we refer to the figure we find the underside shown is that of our insect (*thersites* or *alexius*) and not of *icarus*, var. *icarinus*, that is, the two last spots at the tornus of the upper wing are in line with the preceding one, and the first orange spot of the lower wing is advanced basally; both these characters no doubt occur in *icarus*, but rarely, and the two combined more rarely still. I don't think I have such a specimen, certainly not in the *icarinus* form, and when we take this with the statement that it occurs freely in the South of France, there is no room for doubt as to what the insect is.

This circumstance illustrates in a remarkable way M. Oberthür's demand that all descriptions should be accompanied by good figures. The figure (otherwise of no particular excellence) shows us two items which Cantener did not see and indeed, by implication, denied the existence of, and enables us to know what species he was dealing with. Very possibly some of the claims set forward for *icarinus* being a good species may have been founded on *thersites*, but in the absence of figures, no conclusion can be reached as to them, except to assume that they are *icarinus*, a name that can only be accepted as the variety of *icarus*.

Boisduval's type specimens (♂ and ♀) of *thersites* are in the collection of M. Oberthür, and he has very kindly

* Histoire Naturelle des Lepidoptères Rhopalocères ou Papillons diurnes des départemens des Haut et Bas-Rhin, de la Moselle, de la Meurthe et des Vosges, Par L. P. Cantener, Avocat, ex-Professeur à l'école de Sorège. Paris, 1834.

sent them to me for examination. These are of the species that has been the subject of the inquiries that I report in this paper. As regards size and setting, the male specimen might very well be the one from which Cantener's figure is drawn, neither of these specimens has any label as to locality. There are also two specimens from the Bellier collection, the male labelled "thersites, Boisduval," and also "Digne," the female "Autriche" and "thersites ♀ secundum Bellier"—the latter apparently in M. Oberthür's writing. This female has the first orange spot less advanced than is at all usual in *thersites*, and apart from dissection may be open to a little doubt. There is a further specimen from the Guenée collection, labelled by Guenée, "6. var. ♂, hybridata, Gn., Gn. Ind.", with locality "Hautes Alpes." The label also carries a note by Guenée, "Cette variété très remarquable surtout par la disposition des pointes, est, en dessus, d'un bleu plus sombre, presque comme sur *acis*. Nul doute, que si j'en eusse trouvé plusieurs et autre sexe, je ne l'eusse considéré comme espèce distincte."

I have no doubt that this specimen is one of *thersites*, but it is remarkable in having on both wings the post-discal row of spots, removed outwards so far, that most of them are in contact with the marginal row, a circumstance that sometimes occurs with one or two spots, most frequently that between veins 4 and 5 of the forewing. The spots are also, accordingly, in a very continuous line, curved, of course, but not angled, and straight in the sense of all being close to the marginal series. This specimen is, no doubt, a very unusual aberration. The upperside has a lilac colour, much as in many *icarus* or *thersites*. The specimen is set as an underside and cannot have faded much, but certainly has not now the dark *semiargus* colour noted by Guenée.

As my knowledge of the species is mostly based on material from the South of France, where also it is probably more plentiful than elsewhere, it is appropriate that its name should be that given by a French Naturalist, but this does not detract from the merits of Herr Schreiner, its German discoverer.

Boisduval does not mention *thersites* in the "Index" (1829), nor in the "Icones"; in the "Index" (1840) he merely notes under "89. Alexis, F., etc.," "var.? *thersites*, B., Gallia."

Accepting *thersites* therefore as the name of my butterfly, I may in other respects resume my paper as first written.

The only name that I found to require consideration was *alexius* of Freyer. The name is founded on a butterfly taken at, or near, Weimar, and studied for many years, some two-and-twenty apparently, by Herr Ministerial-Registrator Schreiner, and asserted by him to be a good species and to have nothing to do with *icarus*, *icarinus*, *thersites*, etc. Some of his grounds for this opinion do not appeal to me, such as the darker ground-colour beneath, the brighter marginal spots, and so on, though on the authority of so close an observer as Herr Schreiner obviously was, these differences no doubt marked the local race of *alexius*, in comparison with the local form of *icarus*, and were not without value. The circumstances that led me, however, to believe that Herr Schreiner's species was not *icarinus*, but one we are considering, is first, the fact that it occurred in some numbers, not as a sporadic variety of anything else; then, the fact that Herr Schreiner often found *alexius* paired with *alexius*, but never with *icarus*. That our species occurs at Weimar is most probable, as I have a specimen labelled "Saxe," which is practically the same district.

Herr Schreiner notes one fact that does not accord with the, certainly somewhat meagre, information I have as to other areas, he says that *alexius* does not appear in either the first or second brood, till the corresponding brood of *alexis* has been long on the wing.

We must also attach some little weight to the opinion of Herr Schreiner who was unquestionably a good student, who considered the species to be distinct, after noting it for fifteen years, and after seven years' further observations in view of Freyer's scepticism and doubts, felt sure his opinion was correct.

I cannot resist the conclusion that this butterfly of Schreiner's is the same species as the one I find to be unrecognised, and confounded with *P. icarus* ab. *icarinus*. Herr Schreiner's grounds for believing it to be distinct do not seem to have convinced entomologists since, because of course the facts he brings forward were by no means conclusive ones to any one who had not a belief in Herr Schreiner's intuition in such matters.

Freyer's figure is not unquestionably distinctive of the species in one point, I shall allude to later, the position

of the apical orange spot of the hindwing, though it is rather *thersites* than *icarus*, the butterfly represented might be *icarus*, though there is a certain roundness of wing, which is more marked in the smaller forms of *alexius* (mihi) than in any *icarus*.

Though I was ignorant of Herr Schreiner's name, until this investigation led me to look up Freyer's account of *alexius*, I must express a certain satisfaction, in, so far as I do do so, showing that the work of this keen Entomologist is sound, although it has been treated with contempt for more than half a century.

It is remarkable that Boisduval named our insect *thersites*, but seemed to be sufficiently doubtful about it to refrain from publishing it. This fell to Cantener, who appears to have had no doubt about it. And later, Freyer, though he got so far as publishing for it the name *alexius*, seemed very much in doubt about it, Schreiner being the real author.

Thersites is a rather ungrateful name, and one is tempted to imagine that Boisduval gave it grudgingly and ineffectively, to be rid of the badgering of some one, possibly Cantener himself, who wished the species to be recognised.

I had hoped this summer to have obtained eggs of *thersites* and observed the larval stages. I was, however, rather too early on the ground and so failed, but I made one observation of value, though the species was rather scarce where I found it, *icarus* being fairly common, and I only saw three females of *thersites* altogether, but I found a pair of *thersites in cop.* confirming Herr Schreiner's observation.

As regards spotting otherwise than as to the want of the basal marks, it may be noted that the spots are always quite as strongly marked as in *icarus*, whereas in ab. *icarinus* there is nearly always a tendency for the other spots as well as the basal ones to be weak or wanting. It may also be noted that the two (often conjoined) small spots at the anal angle of the forewing are in *thersites* quite in line with the one above them, whilst in *icarus* they are not, the lower being nearer the hind margin. This is subject to exception in individual cases, due to the variation in position of all the spots to which this section of "blues" is so prone.

As illustrating that these distinctions are only general and have many exceptions I may note specimens of *icaru*

ab. *icarinus* from the North Downs taken by Mr. Grosvenor that look like *thersites* rather than *icarus* and are strongly marked and coloured, and that as regards the post-discal row of spots, Freyer's figures of *icarus*, pl. 616, have this row of spots more in the disposition usual in *thersites* than is shown in his figure of *alexius*, pl. 676.

The point as to which Freyer's figures are indecisive has reference to the apical spots of the hindwing. This is not referred to in the text, and its precise representation may easily have been left to the artist.

One important result of having obtained such an accession of material as the Tutt series, is that I am able to point out those differences in markings between *thersites* and *icarus* (with its var. *icarinus*) that are fairly, if not quite constant, and will perhaps enable the entomologist, who likes something he can easily see, to appreciate the specific distinctions of the two insects.

One very obvious difference in the markings of *icarus* and of *thersites* that is sufficiently constant to enable the great majority of *thersites* to be distinguished from *icarus*, apart from the basal spots, is the relation of the apical orange spot of the hindwing beneath to the two first spots of the post-discal row.

In *thersites*, the black line bounding this spot basally, is level with the second post-discal spot, and it results that its distance from the first post-discal spot is about equal to that between the first and second spots. It may even be rather nearer the first spot than the second is. It is rarely further away and never markedly so.

In *icarus*, the black line of the apical orange spot is further from the base than the second discal spot, and so is obviously further from the first discal spot than the second one is. The position of the orange spot varies more in *icarus* than in *thersites*; and so specimens are not rare in which it occupies much the average position that it does in *thersites*, and may be even nearer the base. Nevertheless few errors would be made in separating the two species by this character without reference to the basal spots of the forewing (pl. LXXXI).

In none of our other common blues does this orange spot take up the position it has in *thersites*. In *thetis*, *corydon*, *eros*, *hylas*, *escheri*, etc., it is as far or further from the base than in *icarus*.

The other difference in markings already alluded to is in the double spot of the post-discal row at the tornus of the forewing. In *thersites* these two spots are in line with the one above them; in *icarus* the lower one is moved outward and often has the form of an oblique line. In this, as in the disposition of the orange spots, *thersites* is much more constant than *icarus*. *Thersites* does not vary to the *icarus* disposition, though *icarus* may be found with the arrangement that obtains in *thersites*.

These distinctions in markings may well be useful in the field, but of course have no such weight in deciding the specific question as the structural differences.

There is another definite distinction between *thersites* and *icarus*, viz. in the androconia. One may imagine this to be connected with a difference of scent, a desirable quality in view of the resemblance of the species otherwise.

These androconia present a considerable difference. One might select one androconial scale of each species such that it would be difficult to say which was which. But with as few as half a dozen of each the discrimination would be easy.

The typical number of rows of dots is five in *icarus* and four in *thersites*. *Icarus* may have four or six, *thersites* may have three or five. *Icarus* usually has a row down the middle of the scale in line with the shaft, in *thersites* the two central rows are usually one on either side of this line.

The distinction between the ribs of the androconial scales might be described as *thersites* having four ribs, and when it has five one is a trace of a rib along the margin. *Icarus* almost always has some trace of a marginal rib, and when it has only four strong ribs it has always a marginal one on each side making six. This is a very common form in *icarus*, whilst it is rare for *thersites* to have quite marginal ribs. In size and form the two scales are much alike, but that of *thersites* is shorter. The amount and constancy of these differences will be better appreciated by a reference to pl. LXXXIII. The ordinary scales also differ in the two species. The two photographs, pl. LXXXII, show the scales and androconia *in situ*, in corresponding portions of the wings of both species. The actual position is immediately in front of the basal portion of vein 6 of the forewing.

The scales in *icarus* are broader, flatter across their ends; in *thersites* their hind margin is full and rounded,

or even produced into a blunt point. The rule in both species seems to be for each scale to be accompanied by two androconial scales, but in *icarus* it is not uncommon for there to be three, a circumstance that is comparatively rare in *thersites*, no doubt in accordance with the narrower scales.

The female genitalia present equally marked differences with the male. There is in the female of these Lycaenids a remarkable tube that in preparing the specimen can be protruded from the orifice between the eighth and ninth segment of the abdomen. I am not now concerned with the anatomy and function of this organ, but here only note that it usually terminates in a chitinous plate or button, that differs more or less in each species.

In *A. thersites* this terminal portion of chitin has a very special form; in *P. icarus* it is wholly wanting, or represented by a very minute chitinous plate, the only species (of the few I have examined) in which it is absent. There are other minor differences, but this one is very obvious and very decisive as to the two species being well separated.

Pl. LXXXIV, fig. 1, represents these parts in *thersites*, fig. 2 those in *icarus*.

A. thersites, notwithstanding its close resemblance to *P. icarus*, is really much more closely allied to *A. escheri*. I don't think any one is likely to confound these two species, although, before I knew much about it, I queried whether *Thersites* var. *gravesi* was not an Eastern form of *escheri*, and though a leading authority on the Lycaenids agrees, so far as the genitalia are concerned, *thersites* is *escheri*.

In this latter respect there is the constant difference of size. It seems desirable nevertheless to figure the ♀ genitalia of *A. escheri*, which shows a small but definite and constant difference, especially in size, from those of *thersites*, and especially photographs of the androconia which differ from those of *thersites* more than do those of *icarus* (pl. LXXXV).

Of the few other species I have examined, *damon* approaches most nearly to *escheri* and *thersites* in the structure of this portion of the female appendages. Apart, therefore, from its behaviour in the field as observed by Herr Ministerial-Registrator Schreiner, by Mr. Tutt and by myself, and from such evidence from the early stages

as has yet to be gathered, we may summarise the following points, of which the first four are very definite structural ones, of distinction between *thersites* and *icarus*.

1. Male appendages belong in *thersites* to genus *Agriades*. Male appendages belong in *icarus* to genus *Polyommatus*.
2. Very marked differences in the female appendages.
3. Forms of ordinary scales upper side of wings differ.
4. Androconia have different forms and ribbing.
5. Basal spots forewing always absent in *thersites*, rarely (ab. *icarinus*) in *icarus*.
6. Advanced position of apical spot hindwing in *thersites* constant, rare in *icarus*.
7. Different alignment of tornal spots forewing.

The series of *icarus* from the Tutt collection, which had been inaccessible for a couple of years, throws a good deal of light on the distribution of *thersites*, and enables one to recognise as referring to *thersites* a number of the localities noted under *icarus* ab. *icarinus* in Tutt's "British Butterflies," vol. iv, p. 158 et seq.

This circumstance illustrates the great value of Tutt's practice of taking and preserving long series from as many localities as possible, a practice which he always endeavoured to impress on others as one that ought to be adopted.

The Tutt series contains specimens of *thersites* from all the localities I have referred to above. In addition, there are specimens of the spring brood from Digne in April. These specimens are remarkably small and pale in coloration, very like some small weakly coloured *icarus*. A specimen from Draguignan in May is much smaller than var. *centro*, but of average coloration. These appear to be the only examples of the first brood. The other examples are almost all taken in August: Via Mala, Ollon, Santa Maria (Münster Thal), Barcelonnette, Stalden, Pfynwald, La Batiaz, Allos (the last four localities ♀♀ only), Albarracin, Tragacete (of my capturing), Fontainebleau (one specimen only), Digne (a full-sized and normally coloured example), Lans-le-Bourg, Susa. Trelex (near Lausanne) provided some large specimens similar to var. *centro*.

Specimens I have from other sources include Siena, identical in general appearance and size with an *icarus*

from same locality, both taken by the Rev. Geo. Wheeler; Autun, Saxe Csolnok, "Wien," "Wallis," Tianshan, Ongadai, Amasia, Piceno Central Italy.

The series of *P. icarus* at the British Museum is very meagre; there are amongst them only some half-dozen var. *icarinus*, and of these I am not sure that even one is *thersites*.

In the Hope Department of the Oxford University Museum are a number of specimens of *A. thersites*.

1 ♂ taken by Prof. Poulton at Montserrat (Barcelona), about 4000 feet, on July 15, 1901.

10 specimens, 9 ♂ 1 ♀, taken July 21–25, 1898, by Miss Cora B. Sanders and by Prof. Poulton, between Visp and Stalden, Upper Echelberg, opposite Visp on the south slopes of the Rhone Valley, and on the Simplon Road near Brieg, 2155 to 2650 ft., the latter (greater) elevation being on the warmer north slopes. The specimens in this series average 32 to 34 mm., one being 36 mm., as large as var. *centro*.

A series of 9 ♂♂ 1 ♀ from N.W. Persia, Seir, 8 miles west of Urumiah, captured August 16 (one August 19), 1898, by R. T. Gunther. These specimens are very similar to var. *orientalis* but are rather more brightly coloured, without being so bright and rich as var. *gravesi*; they expand 24 mm. to 30 mm.

The distribution of the species is only to be vaguely outlined by the material I possess. It seems to be comparatively a southern species—southern, that is, in the same sense that *damon*, *admetus*, and *escheri* are southern, as distinguished from *icarus*, *argus*, etc., that extend further north. The most northern localities I have are Weimar (Schreiner) and Saxony. From France I have specimens only from the south-east, Savoy, Dauphiny and Provence, except one specimen from Fontainebleau. From Italy, Piedmont, Piceno and Siena. Spain affords specimens from Tragacete, Albarracin and Barcelona. Syria, Persia, Central Asia probably imply a wide Asiatic distribution.

In the Rhone Valley it occurs at Trelex (near Nyon on Lac Leman), at Ollon. From here, past Martigny and through the most fully examined portion of the valley, there is no evidence of its existence till we find it in Prof. Poulton's series at Visp, unless perhaps specimens taken by Mr. Tutt and myself, not in the Rhone Valley

but a short way up the Val d'Herens * be, as perhaps they should be, credited to the Rhone Valley. Prof. Poulton's series presents it at Visp on July 21 and 22; Visp to Stalden, July 22; Brieg, Simplon Road, July 24; on the north slopes opposite Visp, July 25—all 1898. The dates probably mark an itinerary rather than dates of appearance.

By way of bibliography and synonymy there are, no doubt, many references to this species under the name of *icarinus*; but it is hopeless to try to unravel these, except that quite recent one by Tutt with which I have already dealt.

THERSITES (Boisd. MSS.), Cantener, Papillons diurnes (1834), p. 35, pl. XI, figs. 1 and 2.

Alexius, Frr. Neu. Beit., vii, p. 133, pl. 676, figs. 1 and 2 (1858).

Alexis, var. Herrich-Schaeffer, Schm. Eur., fig. 246 (1843).

Icarus ab. *icarinus*, *pars*, Auct. & Tutt, Brit. Butt., iv, p. 158.

Var. *gravesi*, Chpm., E. M. M., xlviii, p. 159 and pl. VII, VIII, IX.

Var. *centro*, Chpm., a large form (36–38 mm.) occurring in the Tarentaise and surrounding districts.

Var. *orientalis*, Chpm., an Asiatic form of about size of type and of paler coloration.

The Persian specimens in the Hope collection are much closer to var. *gravesi*.

ab. *hybridata*, Gn. (MSS.).

I have not satisfied myself that other references really belong to our butterfly, e. g. Meigen's *thersites*, pl. XXVIII, fig. 2. *a* and *c* may be *icarus*, the underside, 2*b*, which is more definite, is almost certainly that of *medon*. Gerhard is equally indefinite.

EXPLANATION OF PLATE LXXXI.

Underside of 1. *thersites*, 2. *icarus*, to show the approximation of apical spot of hindwing (marked 1) to first post-discal spot

* Between Vex and Euseigne (3150 ft.), counting elevation as latitude, this is perhaps the most northern habitat of the species.

(marked 2) in *thersites*, making it nearer to 2 than the second post-discal spot (marked 3) is. The reverse being the case in *icarus*. Magnified. It shows also the different alignment of the tornal members of the post-discal series of spots. Photo by A. E. Tonge.

Explanation of Plate LXXXII.

Showing scales and androconia of 1. *thersites*, 2. *icarus*, from identical spots (costal to base of vein 6, forewing) in each species × 300. Photo by F. N. Clark.

Explanation of Plate LXXXIII.

Androconia of 1. *thersites*, and 2. *icarus*, showing differences of size, shape and ribbing × 500.

Explanation of Plate LXXXIV.

Showing terminal segments of abdomen of 1. *thersites* ♀ and 2. *icarus* ♀ × 25 and the differences in the curious eversible structure with a chitinous termination in *thersites*, which is hardly represented in *icarus*.

The everted ventral organ is not fully stretched in either specimen. In 1. the view is exactly lateral for the basal half, so that the two chitinous areas are superposed; in 2. the view is ventral, showing both areas. In neither is it fully extended. The terminal half being still slightly sheathed in the first and the end of the chitinous loop is still doubled back. This does not prevent it being obvious that the whole basal process is larger, wider and more chitinised in *icarus* than in *thersites*, and that in the terminal half *thersites* is much narrower and more slender than is *icarus*. Nevertheless there is a chitinous termination to this portion in *thersites*, of very definite form and outline, while in *icarus* there is merely a chitinous point. This final chitinous armature seems to be of definite peculiar form in each species. *A. damon* is the only species examined in which this armature resembles that of *A. thersites*.

Explanation of Plate LXXXV.

Agriades escheri. Androconia × 500 and ♀ appendages × 25, the latter showing great similarity to those of *thersites* but markedly larger. The androconia are larger than in either *thersites* or *icarus* and have 6 or 7 ribs instead of 4 and 5.